

## REMARKS

The present application includes pending claims 1-25, all of which have been rejected. By this Amendment, claims 1, and 5 have been amended as set forth above. The Applicants respectfully submit that the claims define patentable subject matter.

Claims 1-5, 9, and 13 stand rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 4,759,070 (“Voroba”). Claims 6-8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Voroba in view of United States Patent No. 6,498,852 (“Grimani”). Claims 10-12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Voroba in view of United States Patent No. 5,260,920 (“Ide”). Claims 14-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 5,825,894 (“Shennib”) in view of United States Patent No. 6,067,360 (“Kasai”). Claims 21, 22, 24, and 25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ide in view of Voroba. Claim 23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Voroba in view of Kasai. The Applicants respectfully traverse these rejections at least for the reasons set forth below.

The Applicants first turn to the rejection of claims 1-5, 9, and 13 as being anticipated by Voroba. “A claim is anticipated only if **each and every element** as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *See* Manual of Patent Examining Procedure (MPEP) at 2131 (internal citation omitted). Further, “[t]he identical invention must be shown in as complete detail as it is contained... in the claim.” *See id.* (internal citation omitted).

Voroba discloses a “programmable patient controlled master hearing aid... which consists of a hearing aid test module, an operator’s console and a patient’s console, both

of which are microprocessor based, and all of which are interconnected to provide a testing apparatus which is used by the patient to select electronic components to be employed (sic) in a hearing aid.” Voroba at Abstract.

Voroba discloses an “audio board” that switches and mixes sound. *See id.* at column 7, lines 4-9 (“Both tape decks 65, 66 are connected to an audio board 69 which switches and mixes the sound which is connected to power amplifiers 71 for each of the four speakers 22....”). Voroba, however, does not expressly or inherently describe an audio signal processing system that includes an audiometer, as recited in claim 1, as amended.

The Office Action states “Regarding Claim 5, Voroba further the device being a hearing aid testing apparatus which allow the user to communicate response to the hearing aid (i.e., audiometric system) (Column 2, lines 48-56).” *See* December 1, 2004 Office Action at page 7. This passage states the following:

What has been lacking in the prior attempts to create a master hearing aid testing apparatus is a device which permits the patient to be an intimate and important part of the selection process. It is necessary that the patient communicate his or her amplification preferences fully during the testing process. The patient must then be able to receive a hearing aid which matches as closely as possible the sound quality and other performance characteristics which were preferred during the evaluation.

*Id.* at column 2, lines 48-56. This passage merely summarizes the shortcomings of the prior art. The Applicants respectfully submit, however, that this passage does not expressly or inherently describe a signal processing system that includes an audiometer.

In general, Voroba does not expressly or inherently disclose an audio signal processing system that includes an audiometer, as recited in claim 1. Thus, at least for this reason, Voroba does not anticipate claims 1-5, 9, and 13.

The Applicants also respectfully submit that Voroba does not expressly or inherently disclose loudspeakers that are placed and oriented **arbitrarily** about the listening position, as recited in claims 2 and 3. For example, Voroba discloses the following:

The patient is preferably situated in a sound field listening environment such as that shown in FIG. 1 with a plurality of speakers 22 arrayed around the patient's head so that the natural hearing environment in which the aid is to be used can be recreated. **The speaker array is situated so that the physical design and natural acoustic characteristics of the head and human hearing mechanism are fully utilized during the evaluation.**

*Id.* at column 5, lines 54-61 (emphasis added). Such an arrangement is not arbitrary. Rather, the speaker arrangement depends on the “physical design and natural acoustic characteristics of the head and human hearing mechanism.” Thus, the Applicants respectfully submit that Voroba does not anticipate claims 2 and 3 at least for this reason.

Additionally, with respect to claim 3, Voroba does not expressly or inherently describe loudspeakers that face different directions relative to each other and relative to the listening position. As clearly shown in Figure 1 of Voroba, the speakers 22 all face the listening area. Thus, at least for this reason, the Applicants respectfully submit that Voroba does not anticipate claim 3.

The Applicants next turn to the rejection of claims 6-8 as being unpatentable over Voroba in view of Grimani. The Applicants respectfully submit that the combination of Voroba and Grimani does not render claims 6-8 unpatentable at least for the reasons discussed above.

Grimani "relates generally to system for producing the soundtrack content for a low-frequency only channel in a multichannel soundtrack, and more particularly to a method and apparatus for deriving or creating an audio Low Frequency Effect (LFE) signal in 5.1, 6.1, and 7.1 channel sound tracks and musical recordings." Grimani at column 1, lines 13-18. Grimani discloses a system that splits low frequency signals of sound tracks and musical recordings.

Each "Main" signal, 11 through 15, fed to the processor is split and processed in three blocks: Block One comprises a detector 1, which analyzes the low frequency content of the incoming signal and controls both Block Two, the VSN 2, and Block Three, the VGA 3 (Variable Gain Amplifier). VSN 2 is a variable low shelving network in which the amount of low frequency attenuation is variable and which responds to a first control signal 4 from the Detector circuit. Block Three, the VGA is a variable gain circuit in which the gain responds to a second control signal 5 from the Detector circuit. When the low frequency level of an incoming signal exceeds a threshold programmed into the Detector circuit, the VSN begins to attenuate low frequencies and the VGA gain increases from 0X and starts to feed signals into the Summing networks 6 leading to the LFE Output 40.

*Id.* at column 3, lines 26-41.

The Applicants respectfully submit, however, that Grimani does not teach, nor suggest, “wherein all but one of the plurality of processed audio signals comprises discrete adjusted versions of the plurality of audio signals and wherein the one of the plurality of processed audio signals comprises a combination of the plurality of audio signals,” as recited in claim 6.

The Applicants also respectfully submit that Grimani does not teach, nor suggest, a subwoofer, as recited in claim 7. The Office Action cites Figure 2 “low frequency signal 40” to reject claim 7. However, reference numeral 40 is merely an “LFE Output 40” (*see id.*, *e.g.*, at column 3, line 41), and there is absolutely no mention of a subwoofer in Grimani. Thus, at least for this reason, the combination of Voroba and Grimani does not render claim 7 unpatentable.

The Applicants now turn to the rejection of claims 10-12 as being unpatentable over Voroba in view of Ide. The Applicants respectfully submit that the combination of Voroba and Ide does not render claims 10-12 unpatentable at least for the reasons discussed above.

The Applicants now turn to the rejection of claims 14-20 as being unpatentable over Shennib in view of Kasai. The Office Action states that “Figure 7 [of Shennib] discloses speaker 93 located over the head position and center”. December 1, 2004 Office Action at page 11. Shennib discloses a system in which “[t]hree of the speakers, i.e., #1 (89), #5 (93), and #6 (94) are located in the sagittal plane 96 containing the head reference point 88. Speakers #1, #5, and #6 are positioned at altitude angles  $0^{\circ}$ ,  $45^{\circ}$ , and  $-45^{\circ}$ , respectively, as shown in FIG. 7 at B.” Shennib at column 15, lines 7-11. As

shown in Figure 7 of Shennib, the speaker 93 is located in front of, and above, the head reference point 88. Because the speaker 93 is in front of the head reference point 88, it is not overhead. Speaker 93 is not “located at an **overhead center position** above the test subject in the listening position.” Further, Kasai also does not teach or suggest a speaker located at such a position. Thus, the Applicants respectfully submit that the combination of Shennib and Kasai does not render claims 14-20 unpatentable at least for this reason.

Additionally, the Applicants maintain that one having ordinary skill in the art would not be motivated to combine Shennib and Kasai to produce a “multi channel sound reproduction system for testing hearing and hearing aids,” as recited in the claims of the present application. Shennib “relates to hearing evaluation and hearing aid fitting.” Shennib at column 1, lines 10-13. On the other hand, Kasai relates to “an apparatus and method for localizing a sound image, more specifically the simplification of its structure and processes.” Kasai at column 1, lines 15-17. In particular, Kasai relates to “surround sound” systems.

The Applicants respectfully submit that these are nonanalogous areas of art and one having ordinary skill in the art would not be motivated to combine them. As set forth in the background section of the present application at pages 6-7:

It may be suggested that a system similar to entertainment “surround sound” systems may be used to address many of the above-mentioned problems. However, such entertainment systems are not suited for use in hearing and hearing aid assessment for many reasons. For example, in entertainment audio systems, the loudspeakers are located substantially distant from the listener, at or near the perimeter of a listening area that is accessible to multiple

listeners. As with previous multiple-loudspeaker systems used in hearing and hearing-aid assessment, signals received by listeners from such entertainment audio systems contain a substantial contribution of the acoustical qualities of the listening environment. In any system that delivers signals containing the acoustical qualities of the listening environment as such, a given recording sounds somewhat different in different listening environments and has different acoustical qualities in each listening environment. Such systems, therefore, do not enable the desired standardization for hearing and hearing aid assessment.

In addition, entertainment audio systems are designed so that background noises presented to the listener enhance or support the reception of an entertainment event, such as a primary audio signal or a visual picture. In the real world, however, background noises presented to the listener do not enhance or support the reception of a primary audio signal or a visual picture. Instead, background noises disrupt or compete with the reception of such primary stimuli, resulting in conditions under which the reception of such primary stimuli breaks down. It is these real-world conditions that are desirable for hearing and hearing aid assessment.

As such, the Applicants respectfully submit that one would not be motivated to combine the entertainment audio system of Kasai with the system of Shennib to produce the system for testing hearing and hearing aids as recited by the claims of the present application. At least for this reason, the Applicants respectfully submit that claims 14-20

should be in condition for allowance.

The Applicants now turn to the rejection of claims 21, 22, 24, and 25 as being unpatentable over Ide in view of Voroba. The Applicants respectfully maintain that one having ordinary skill in the art would not be motivated to combine Voroba with Ide to produce the inventions recited in the claims of the present application. Voroba discloses a “programmable patient controlled master hearing aid” (*See Voroba at Abstract*), while Ide discloses a “system for reproducing a sound field simulating a real acoustic space” (*See Ide at Abstract*).

As discussed in the background of the present application:

However, such entertainment systems are not suited for use in hearing and hearing aid assessment for many reasons. For example, in entertainment audio systems, the loudspeakers are located substantially distant from the listener, at or near the perimeter of a listening area that is accessible to multiple listeners.

In stark contrast, the sound reproduction system of Ide is located in a large room.

FIG. 2 shows an example of construction of the sound reproduction system according to the invention. As the sound reproduction system, a three-dimensional space 40 which is substantially similar to the assumed three-dimensional space 10 of the sound collection system is assumed to exist. As the three dimensional space 40 of the sound reproduction system, **a room, e.g., a listening room, can be used. In the case of using a larger space, like halls or an outdoor space, the entire space can be used by zoning a determined space or ignoring the capacity**



**of space.**

Ide at column 5, lines 10-20 (emphasis added). In short, Ide discloses a system in which speakers are placed at relatively large distances from one another in a room. As discussed in the present application, such entertainment systems are not suited for use in hearing and hearing aid assessment for many reasons. The speakers disclosed in Ide are located substantially distant from the listener, at or near the perimeter of a listening area that is accessible to multiple listeners. One having ordinary skill in the art would not be motivated to combine Ide with any other reference to produce systems or methods recited in the claims of the present application, which are directed to testing hearing and hearing aids. Thus, the Applicants respectfully submit that claims 21, 22, 24, and 25 should be in condition for allowance, at least for this reason.

The Applicants finally turn to the rejection of claim 23 as being unpatentable over Voroba in view of Kasai. The Applicants respectfully submit that one having ordinary skill in the art would not be motivated to combine Kasai with Voroba. As discussed above, Kasai relates to “an apparatus and method for localizing a sound image, more specifically the simplification of its structure and processes.” Kasai at column 1, lines 15-17. In particular, Kasai relates to “surround sound” systems. As discussed in the present application, such entertainment systems are not suited for use in hearing and hearing aid assessment for many reasons. One having ordinary skill in the art would not be motivated to combine Kasai with any other reference to produce a system or method as recited in the claims of the present application, which are directed to testing hearing and hearing aids. Thus, at least for this reason, the Applicants respectfully submit that claim 23 should be in condition for allowance.

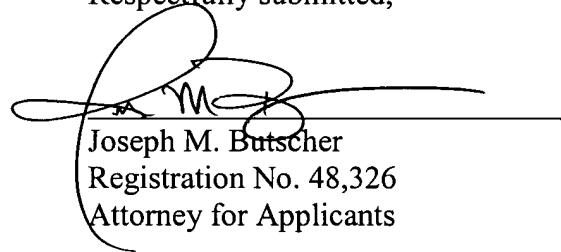
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The Applicants respectfully submit that claims 1-25 of the present application should be in condition for allowance at least for the reasons discussed above and request reconsideration of the claim rejections. If the Examiner has any questions or the Applicants can be of any assistance, the Examiner is invited to contact the Applicants. The Commissioner is authorized to charge any necessary fees or credit any overpayment to the Deposit Account of McAndrews, Held & Malloy, Account No. 13-0017.

Respectfully submitted,

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MCANDREWS, HELD & MALLOY, LTD.  
500 West Madison Street, 34th Floor  
Chicago, Illinois 60661  
Telephone: (312) 775-8000  
Facsimile: (312) 775-8100



Joseph M. Butscher  
Registration No. 48,326  
Attorney for Applicants